



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
JOHN F. KENNEDY SPACE CENTER  
KENNEDY SPACE CENTER, FLORIDA 32899

Shuf  
for  
RCP

REPLY TO  
ATTN OF:

AA-GSO-3/5724/72-223-61

AUG 20 1972

MEMORANDUM

TO: Distribution

FROM: AA/Manager, Apollo-Skylab Programs

SUBJECT: Skylab Program Directive No. 58, "Post-Acceptance Change Control"

REF: Briefing Note to Dr. Debus from AA, dated August 22, 1972, Subject same as above

A copy of subject document with referenced briefing note is attached for your information. This directive supplements Sections I through IV of SPD #34, "Skylab Program CCB Controls and Reporting Requirements", and cancels and supersedes Section V to SPD #34 which deals with the control of work and hardware changes at KSC. It establishes requirements for processing changes implemented subsequent to factory acceptance and defines the roles and relationships among the centers.

No change in KSC Skylab Configuration Management requirements are needed at this time.

  
Robert C. Hock

Enclosures: a/s

Distribution:

- AD/Director of Administration
- DE/Director of Design Engineering
- IS/Director of Installation Support
- LO/Director of Launch Operations
- LS/Director, Spacecraft Operations
- LV/Director, Launch Vehicle Operations
- TS/Director of Technical Support
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cc:

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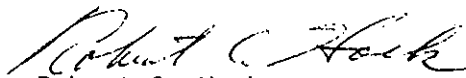
TO: Dr. Debus

SUBJECT: Skylab Program Directive #58 "Post-Acceptance Change Control"

Subject directive was approved by John H. Disher for William C. Schneider on July 6, 1972. This supplements Sections I through IV of SPD #34 "Skylab Program CCB Controls and Reporting Requirements" and cancels and supersedes Section V to SPD #34 which deals with the control of work and hardware changes at KSC. It establishes requirements for processing changes implemented subsequent to factory acceptance and defines the roles and relationships among the centers.

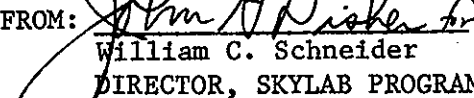
The directive states that only mandatory hardware changes shall be approved for implementation subsequent to acceptance of an end item. It is also noted that the Design/Integration Center(s) shall provide recommended periods of incorporation for changes to be accomplished at KSC but that the actual period of incorporation shall be established at the time of joint disposition of each change by all affected centers.

Compliance to this directive will not require any change to the way KSC does business. It will be distributed to the heads of primary organizations and to their respective Configuration Management Offices.

  
Robert C. Hock

SKYLAB PROGRAM DIRECTIVE NO. 58

TO: Distribution

FROM:   
William C. Schneider  
DIRECTOR, SKYLAB PROGRAM

SUBJECT: Post-Acceptance Change Control

OFFICE OF PRIME RESPONSIBILITY: Skylab Engineering (MLE)

REFERENCES: (a) M-D ML 3200.084, Skylab Program Directive No. 11A, Sequence and Flow of Hardware Development and Key Inspection, Review and Certification Checkpoints, dated October 14, 1970

(b) M-D ML 3200.137, Skylab Program Directive No. 34, Skylab Program CCB Controls and Reporting Requirements, dated January 19, 1971

I. PURPOSE

The purpose of this directive is to establish requirements for processing changes which are to be implemented subsequent to the completion of factory acceptance (Configuration Inspection or equivalent as defined by Reference a) and to define the roles and interrelationships among the centers responsible for hardware development, integration, launch operations and mission operations.

II. SCOPE

This directive defines the requirements and responsibilities for initiating, authorizing, implementing and documenting all post-acceptance changes to Skylab flight hardware, (including experiments and stowage items) and associated support equipment while located at the:

Development site (MSC, MSFC or contractor facility)  
Integration site (MSC, MSFC or contractor facility)  
Launch site (KSC)

III. APPLICABILITY

Center program managers performing Skylab effort shall institute procedures to implement this directive within 45 days of issuance, where such procedures are not already established and responsive to the requirements set forth herein. Intercenter problems arising from this implementation, or noncompliance which cannot be resolved at the center level shall be brought to the immediate attention of the Skylab Program Director (ML).

This program directive supplements Sections I through IV of Reference (b) and cancels and supersedes Section V of Reference (b).

IV. REQUIREMENTS

## A. General

1. Only mandatory hardware changes (required to assure flight or launch crew safety and/or mission success) shall be approved for implementation subsequent to acceptance of an end-item.
2. To the maximum extent practicable, changes to experiment hardware and flight crew equipment (FCE) shall be accomplished at the hardware developer's facility:
  - a. Prior to delivery, or where not possible,
  - b. By return of the end-item to the developer from the integration site or KSC for modification, or
  - c. By substitution of an updated backup or other equivalent unit.

This should be established at the time of joint disposition of each change by all affected centers.

3. Changes originated for the correction of emergency situations may be implemented immediately consistent with the requirements set forth in Section IV item C.5. An emergency situation exists when an engineering change is required to:
  - a. Prevent injury to personnel,
  - b. Prevent serious damage to equipment,
  - c. Complete a scheduled test, the delay of which would seriously impact the ability to comply with program commitments or scheduled milestones.
4. Changes which are to be installed and verified between FRT/CDDT and launch shall require the approval of the Skylab Program Director (ML), or his designee, as set forth in Reference b, paragraph I.B.9.
5. Proposed changes which cannot be resolved to the mutual satisfaction of any center shall be submitted to the Level I CCB for disposition.

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## B. Open Work

1. An itemized listing of all work originally intended to be accomplished prior to delivery, but which shall now be accomplished at KSC (open work) shall be baselined by the Level II CCB of each responsible center. These baselined listings and additional Level II CCB approved open work changes shall be the program authority for all work transferred to KSC. The concurrence of the KSC Skylab Program Manager or his designee shall be required for all such action. Open work shall include:
  - a. Work required to correct and close discrepancies and non-conformances resulting from acceptance reviews and systems test and checkout activities.
  - b. All retrofit changes as well as tests assigned to new work locations and work resulting from make play changes or other nonscheduled activities.
2. The identification and status of all open work shall be maintained in an open work accountability system which includes all changes to flight hardware, backup units and associated support equipment approved for incorporation subsequent to end-item acceptance. This system shall account for all open work by module, end-item and serial number and shall include identification of the period of incorporation, the estimated man hours to accomplish implementation of the modification and the responsibilities for modification package preparation, installation and installation support.

These data shall be updated to reflect completion of modification incorporation, including test and checkout, upon receipt of notification thereof from the responsible center.

## C. Modifications

1. Changes proposed for post-acceptance implementation may be originated at any center, and all such changes shall be:
  - a. Approved by the responsible Development Center Level II CCB (or equivalent for development centers other than MSC or MSFC).
  - b. Coordinated with and concurred in by all other centers (Integration Center, Mission Operations Center, Launch Operations Center) affected by the change.

2. Flight hardware developed by a center other than MSC or MSFC may be modified at an integration site or KSC. The concurrence of the KSC Skylab Program Manager (or his designee) and the Skylab Program Manager of the center responsible for integration shall be required.
3. The Design/Integration Center(s) shall provide recommended periods of incorporation for each change proposed to be accomplished at KSC. The actual period of incorporation shall be established at the time of joint disposition of each change by all affected centers.
4. The applicable Development Center shall authorize the preparation of all modification packages.
5. The Development and Integration Centers shall identify single point of contact representatives with authority to approve "emergency" changes (as defined in Section IV item A.3) to hardware delivered to another center.
  - a. Joint authorization by all affected centers shall be required for emergency changes. Concurrence of the KSC Skylab Program Manager (or his designee) shall be required for changes implemented at KSC or for hardware removed and modified at the hardware developer's facility and returned to KSC.
  - b. Formal Level II CCB documentation of emergency changes shall be processed within 30 days after authorization of such changes.

#### V. RESPONSIBILITIES

- A. The Development Center Level II CCB shall have all changes which may affect any of the following forwarded to the other affected centers for intercenter coordination and concurrence prior to the mutual final disposition of the change:
  1. Intercenter interface requirements,
  2. Deferred or open work/tests for KSC or an integration site,
  3. Test and checkout plans, requirements or schedules,
  4. Mission planning, including simulator configuration and training procedures.
  5. Stowage requirements.

- B. The Integration Center shall review changes for systems compatibility to assure that:
1. Prior system integration test results are not nullified by the change.
  2. Compatibility is maintained, as an integrated system, of flight hardware elements and ground support equipment.
  3. Physical and functional interfaces of subsystems, systems and flight hardware elements and ground support equipment are maintained for the cluster as well as the overall stacked vehicle for each flight.
- C. The Mission Operations Center (MSC) shall assess the impact of changes on mission and mission support requirements, including training procedures, simulator configuration and flight and ground crew training plans.
- D. The Launch Operations Center (KSC) shall assess the impact of changes on launch and launch support requirements, including the launch complex, GSE and test plans and procedures.
- E. All affected centers shall participate in the joint Level II disposition of each change planned for implementation subsequent to the acceptance of the end-item. Responsibilities for implementation of the change (i.e., modification kit fabrication, installation and support requirements) and the period of incorporation shall be specified by CCB directives (CCBDs).

Work transferred to either KSC or an integration site shall require the concurrence of the cognizant center Skylab Program Manager (or his designee).

- F. Each Development Center and the applicable Integration Center shall maintain an open work status/accounting system which includes the data specified in Section IV, item B.2.

These data shall be updated to reflect completion of modification incorporation, including test and checkout, upon receipt of notification thereof from the responsible center.

- G. The Development Center shall be responsible for the implementation of modifications to hardware located at a development site or at an integration site. The implementation of modifications to hardware located at KSC shall be the responsibility of the Launch Operations Center, with support from the hardware developer, as required.



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- H. The center responsible for implementation of a modification shall provide notification to the Development Center and to the Integration Center upon completing the incorporation of a modification, including installation, test and checkout.
- I. Emergency changes to flight hardware (including the associated GSE) delivered to another center shall be authorized by all affected centers, consistent with the requirements set forth in Section IV, item C of this directive. Formal ECP processing for such changes shall be the responsibility of the Development Center.
- J. The Development Center shall obtain the approval of the Skylab Program Director (ML) or his designee prior to the approval of any changes which must be implemented subsequent to FRT/CDDT or which fall within the criteria specified in Reference b. Section I, paragraph B.9.

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